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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/590,962

08/29/2006

Frank Arndt

4001-1227

5638

466 7590 08/20/2008

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EXAMINER

ROSENAU, DEREK JOHN

ART UNIT

PAPER NUMBER

2834

MAIL DATE

DELIVERY MODE

08/20/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,962	<b>Applicant(s)</b> ARNDT ET AL.	
	<b>Examiner</b> Derek J. Rosenau	<b>Art Unit</b> 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 May 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Drawings*

1. The drawings were received on 19 May 2008. These drawings are accepted.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1,3, 5, 6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lardiere et al. (US 4982121) in view of Pei et al. (US 2004/0263028).
4. With respect to claim 1, Lardiere et al. discloses a cladding (Figs 5 and 6) comprising: an elastic boundary layer (items 26) which forms the surface of the cladding (Figs 5 and 6), and an actuator (items 13 and 14) in the form of a membrane actuator which forms the cladding for the deformation of the boundary layer (Figs 5 and 6), wherein the cladding bears on a substrate (Fig 5) by means of a bearing area which matches the surface area of the cladding in terms of magnitude (Fig 5), with only subregions of the bearing area being fixed to the substrate (Figs 5 and 6).

Lardiere et al. does not disclose expressly that a polymer actuator is integrated in the cladding for the deformation of the boundary layer.

Pei et al. teaches a cladding with an elastic boundary layer in which a polymer actuator (Paragraph 114) in the form of a membrane actuator (Fig 1E) is integrated in the cladding for the deformation of the boundary layer (Fig 1E).

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At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the polymer actuator of Pei et al. with the device of Lardiere et al. for the benefit of the improved efficiency of polymer actuators (Paragraph 16 of Pei et al.).

5. With respect to claim 3, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 1. Lardiere et al. discloses that the cladding is fixed to the substrate at regular intervals in a punctiform manner (Fig 5 and 6).

6. With respect to claim 5, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 1. Lardiere et al. discloses that the cladding is composed of individual lamellae which are each fixed to the substrate by means of one end, with the lamellae each being polymer actuators in the form of bending actuators (Figs 5 and 6).

7. With respect to claim 6, Lardiere et al. discloses a cladding (Figs 5 and 6) comprising: an elastic boundary layer (items 26) which forms the surface of the cladding (Figs 5 and 6), and an actuator (items 13 and 14) in the form of a membrane actuator which forms the cladding for the deformation of the boundary layer (Figs 5 and 6), wherein the cladding bears against a substrate (Fig 5) by means of a bearing area which matches the surface area of the cladding in terms of magnitude (Fig 5), with the cladding being firmly connected to the substrate by means of the entire bearing area (Figs 5 and 6) and having at least one electrode layer (item 13) for the actuator, which electrode layer extends only over a subregion of the polymer actuator (Figs 5 and 6).

Lardiere et al. does not disclose expressly that a polymer actuator is integrated in the cladding for the deformation of the boundary layer.

Pei et al. teaches a cladding with an elastic boundary layer in which a polymer actuator (Paragraph 114) in the form of a membrane actuator (Fig 1E) is integrated in the cladding for the deformation of the boundary layer (Fig 1E).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the polymer actuator of Pei et al. with the device of Lardiere et al. for the benefit of the improved efficiency of polymer actuators (Paragraph 16 of Pei et al.).

8. With respect to claim 8, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 6. Lardiere et al. discloses that the substrate forms an electrode for the actuator (Figs 5 and 6, item 14). In combination with Pei et al., it would form an actuator for the polymer layer of the polymer actuator.

9. With respect to claim 9, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 1. Lardiere et al. discloses that the boundary layer is in the form of an auxiliary layer (item 26) on the actuator (Figs 5 and 6).

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lardiere et al. in view of Pei et al. and Zalalutdinov et al. (US 2006/0239635).

11. With respect to claim 4, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 1.

Neither Lardiere et al. nor Pei et al. discloses expressly that the cladding is provided with though-holes.

Zalalutdinov et al. teaches a cladding device actuated by a piezoelectric element in which a through-hole (item 135) is provided in the cladding.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the hole of Zalalutdinov et al. with the device of Lardiere et al. as modified by Pei et al. for the benefit of reduced weight.

12. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lardiere et al. in view of Pei et al. and Kihara et al. (US 2002/0043901).

13. With respect to claim 7, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 6.

Neither Lardiere et al. nor Pei et al. discloses expressly that the electrode layer forms the webs of a honeycomb-like structure on the polymer layer.

Kihara et al. teaches a piezoelectric device in which the electrode is in the form of the webs of a honey-comb-like structure (Fig 8D).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the honeycomb-like electrode of Kihara et al. with either or both of the electrodes of Lardiere et al. for the benefit of allowing for easy fabrication (Paragraph 85 of Kihara et al.).

14. With respect to claim 10, the combination of Lardiere et al., Pei et al., and Kihara et al. discloses the cladding as claimed in claim 7. Lardiere et al. discloses that the substrate forms an electrode (item 14) for the actuator. In combination with Pei et al., it would form an actuator for the polymer layer of the polymer actuator.

***Response to Arguments***

15. Applicant's arguments filed 19 May 2008 have been fully considered but they are not persuasive.

Applicant argues that the cladding of Lardiere et al. is not fixed only in subregions of the boundary layer, as applicant argues that items 21, 13, 14, 29, and 31 are part of the cladding and item S would be the surface to be cladded. However, item 21 does not appear in figures 5 and 6, and it is not apparent how it could be considered part of the cladding. Items 13, 14, 29, and 31 are the actuation mechanism, and while items 13 and 29 may be considered part of the cladding, items 14 and 31 are not considered part of the cladding, and are interpreted by the examiner as the surface to be cladded. If items 14 and 31 are interpreted as the cladded surface, then the cladding would be fixed only on subregions of the boundary layer.

Applicant argues that the bearing area does not match the surface area of the cladding. However, as can be seen in figure 5 of Lardiere et al., the bearing area and cladding area do match.

Applicant argues that a combination of Lardiere et al. and Pei et al. result in a device in which the thickness of the polymer layers remain more or less constant during operation, and that in the present invention the electrode-network acts on areas with different thicknesses because the polymer layer is displaced when the electrode-network is activated by the substrate electrode. First, these arguments are directed to functional aspects of the device. Second, the claims do not contain limitations directed to these functional aspects.

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16. Applicant's arguments, see amendments/arguments, filed 19 May 2008, with respect to the drawings and specification have been fully considered and are persuasive. The objections to the drawings and specification have been withdrawn.

***Conclusion***

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is (571)272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Derek J Rosenau  
Examiner  
Art Unit 2834

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Examiner, Art Unit 2834

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